

EXHIBIT G

head and a sharply tapering tail. The pupa stage lasts for about 2 weeks (longer if weather is unusually cold), from which the insect transforms into a rather drab gray-brown or light-brown moth having a wingspread of about 1.5 inches (about 4 centimeters). The moth can be recognized by a prominent white dot, centered in each front wing. The moth is active only at night. Light and the odor of decaying fruit attracts the moth.

The female moth lays her eggs (500 or more) in clusters or rows, preferring to place them on leaves of grasses. Pale green in color, the young worms tend to "loop" as they move about. These worms may be found by the thousands and tens of thousands in grass and fields of small grain and, frequently, are not detected until their damage has become extensive. The worms feed only at night. When fully grown, the worm is about 1.5 inches in length (4 centimeters). They maintain a green-brown color and have longitudinal stripes. After feasting for several days, the worms enter back into the soil, change to the pupal stage, and re-emerge as moths in from 2 to 4 weeks. In this fashion, there may be two to three generations per year. The larvae of the last generation of the year usually appear between mid-August and mid-September, depending upon locale and weather conditions.

Poison bran is an effective measure, particularly to protect fields which have not yet been attacked. The bran is placed in a line stretching across the probable line of march of the insect once an adjacent field has been decimated. The bait is prepared from bran that is mixed with insecticide. Blackstrap molasses or lubricating oil usually is added to provide sufficient stickiness to keep the insecticide and bran together. The worms also like molasses.

The armyworm is quite similar to the army cutworm, described in the entry on **Cutworm**.

A closely related species is the *fall armyworm* (*Laphygma frugiperda*, Smith). Although widely distributed, they are notably injurious to crops in the southern United States, particularly during years when there has been a cold and wet spring. Like the armyworm and the cutworm, these insects also prefer small grains, maize (corn), sorghum, and grasses, but they also attack alfalfa, bean, cabbage, groundnut (peanut), cucumber, potato, sweet potato, spinach, and turnip. These worms are particularly fond of lawn grasses and thus are a serious economic pest not only to the food producer, but to the homeowner as well.

Actually, the fall armyworm is considered a tropical insect because it cannot winter over in any area where the soil is frozen hard. Thus, a favorite winter ground is along the Gulf Coast and in southern Florida. Here, during winter, several stages of the insect may be present at the same time. After their number is increased many fold in the spring; they swarm northward, often flying many hundreds of miles before selecting a location for their egg-laying. Each female moth lays about 1000 eggs, usually on green plants. The female covers clusters of eggs with hairs from her body. Shortly thereafter, the young larvae descend down through the heart of a plant and continue feeding near groundlevel until they assume a length of from 1 to 1.5 inches (2.5 to about 4 centimeters). It is at about this time that the insects are noticed as the result of the large amount of damage that becomes apparent. Unlike the armyworm and most cutworms, the worms do not take refuge in the soil during daytime, but rather they cling to parts of plants.

Quite similar in appearance to the true armyworm, the fall armyworm larvae when fully grown are a light-tan to green in color, although sometimes they are black. There are three very narrow white stripes down their back. They can be contrasted with the true armyworm by observing a white inverted "Y" design on the front of the head. Also, the tubercles are more prominent and they have more hair. The marching habit of this worm occurs during the autumn in the northern climes, but can take place in the southern states any time after the middle of summer and, if weather conditions are ideal for the insect, such marches may occur in early spring. An entire field or garden can be consumed within 36 to 48 hours. The remaining life cycle of the fall armyworm is similar to that of the true armyworm.

Another closely related species is the *beet armyworm* (*Laphygma exiqua*). This is a large caterpillar ranging up to 1½-inch (30–32 millimeters) in length when fully mature. It is olive-green with broad light-green striping. Sugarbeet is the favorite target crop of this insect, followed by table beet and a variety of vegetables, citrus, alfalfa, and some wild grasses. This insect, native to the Orient, was first noted in Cali-

fornia in the late 1870s and now occurs widely in the Gulf States, and from those states westward into California and northward to Nebraska and Kansas. Its habits are quite similar to those of the fall armyworm. Control is similar.

AROIDS. A large group of monocotyledonous plants, mostly tropical, having a characteristic flower habit. The numerous small inconspicuous flowers are borne on a fleshy stalk or spadix, which is surrounded, more or less completely, by a large, expanded, often brightly colored bract called a spathe. The spadix and spathe together are often but incorrectly considered to be the flower of the plant. The aroids are perennial plants, generally having tubers or rhizomes from which rise large leaves. Many tropical members are climbing plants. Well-known species are the Skunk Cabbage, whose foul-scented flowers appear so early in the spring, the Jack-in-the-Pulpit, and the wild arum, *Calla palustris*, of cold swamps, as well as the Sweet Flag, *Acorus calamus*, of the marshes. The cultivated Calla Lilies are all aroids and not lilies at all; some of them are delightfully fragrant. On the other hand, in species of *Amorphophallus*, which are sometimes seen in collections of cultivated plants, the vile odor of the flower structure prevents them from becoming popular; the spathe and spadix of some of them are of gigantic size. In the tropics several species of *Colocasia* are cultivated for the edible rhizomes which appear under the name of dasheen or taro. *Monstera* and several species of *Philodendron* are popular decorative plants in homes and in public buildings.

AROMATIC COMPOUND. An organic compound that incorporates a closed-chain or (ring) nucleus in its structure. This is in contrast with the aliphatic compound which is comprised of an open-chain structure. The classical example of an aromatic compound is benzene. Aromatic compounds also are sometimes referred to as benzenoids. Some ring-type compounds are not classified as aromatic. These include the cycloparaffins and cycloolefins which are considered to be derivatives of methane. See also **Compound (Chemical)**; **Organic Chemistry**.

ARRHENIUS-GUZMAN EQUATION. A relation between the viscosity η and temperature T , at constant pressure,

$$\eta = A \exp \frac{B}{RT}$$

where A , B are constants, and R is the gas constant; B may be identified with the *activation energy for liquid flow*.

ARRHENIUS VISCOSITY EQUATIONS. (1) Effect of temperature on viscosity, η , of a liquid

$$\frac{d}{dT} \ln(\eta v^{1/3}) = \frac{k_1}{T^2}$$

where v is the specific volume and k_1 is a constant.

(2) Viscosity of solutions, η ,

$$\eta/\eta_s = A^x$$

where x is the concentration, η_s is the viscosity of the solvent and A is a constant.

(3) Viscosity of a sol, η ,

$$\log \eta/\eta_\infty = kC$$

where η_∞ is the viscosity of the medium and C is the concentration of the sol-forming material.

ARRHYTHMIAS (Cardiac). An arrhythmia is a variation from what is considered normal for a rhythmic phenomenon. An analogy would be an erratic tape recorder whose speed vacillates and differs from that one speed which yields perfectly normal reproduction of music or voice. While the heart has a reasonably wide range in beating rate (pulse rate), depending upon the body's energy requirements (spanning from rest to heavy exertion), the rhythm of heart action is preserved even though rate may be changed. Rhythmic disturbances of the heart are called *cardiac arrhythmias*. Because, as explained in **Heart and Circulatory**

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